

Presentation of Chromium 6 Treatment Findings at Glendale to the LA County Board of Supervisors

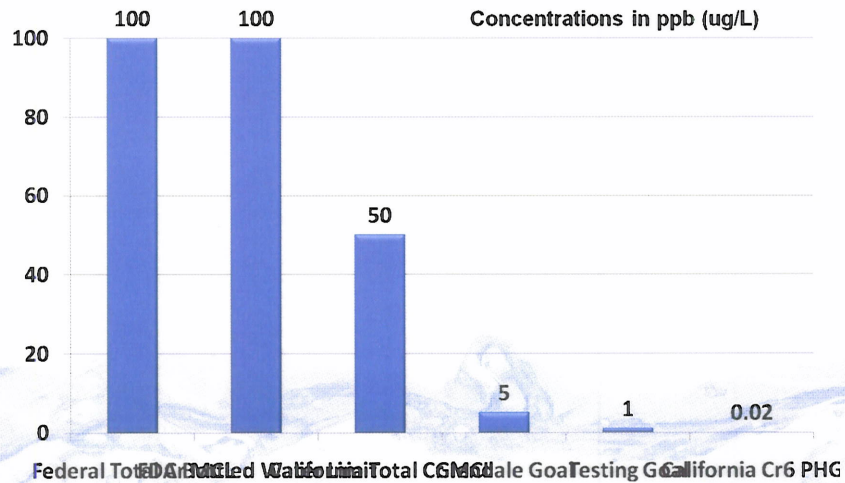
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Objectives

- Identify effective technologies to treat chromium and determine cost impact
- Provide CDPH and USEPA information to form a scientifically sound foundation on which to establish a new regulatory limit (MCL)

Current Chromium Regulations and Goals in Drinking Water



PHGs and MCLs

- From OEHHA's Website:

The public health goal for chromium 6 is not a maximum "safe" level for exposure to the chemical. Rather, it serves as an assessment of the health risk posed by drinking water that contains chromium 6, based on an estimated "one in one million" lifetime cancer risk level. For every million people who drink tap water with that level of chromium 6 each day for 70 years, there is likely to be one additional case of cancer from exposure to the chemical.

- CDPH is then required to set the MCL as close to the PHG as economically and technically feasible.

Example of Difference between PHG and MCL

| | PHG | MCL |
|------------|-----------|------------------|
| Arsenic | 0.004 ppb | 10 ppb |
| Chromium 6 | 0.020 ppb | To be determined |

Leading Technologies for Chromium 6 Removal

Anion Exchange

- Weak Base Anion Exchange (WBA)
- Strong Base Anion Exchange (SBA)

Reduction/ Coagulation/ Filtration (RCF)

High-Pressure Membrane Filtration

- Nanofiltration (NF)
- Reverse Osmosis (RO)



Reduction/Coagulation/Filtration



Weak-Base Anion Exchange

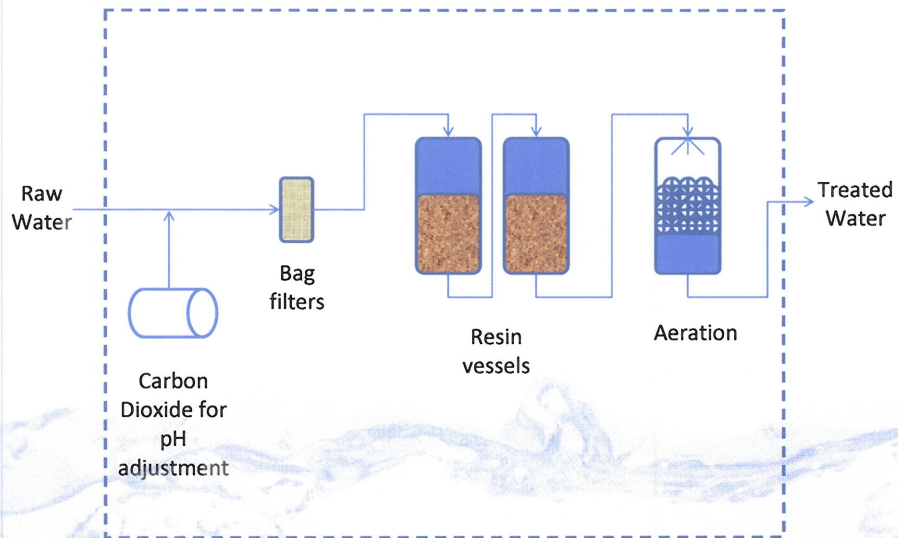


Strong-Base Anion Exchange with Residuals Treatment



Reverse Osmosis

Weak Base Anion (WBA) Exchange



WBA – Demonstration Testing at Glendale



New Ion Exchange Resin

- 425 gallons per minute
- Treatment of Well GS-3
- Operation for more than 1 year before resin had to be replaced
- Continues to operate

RCF – Demonstration Testing at Glendale

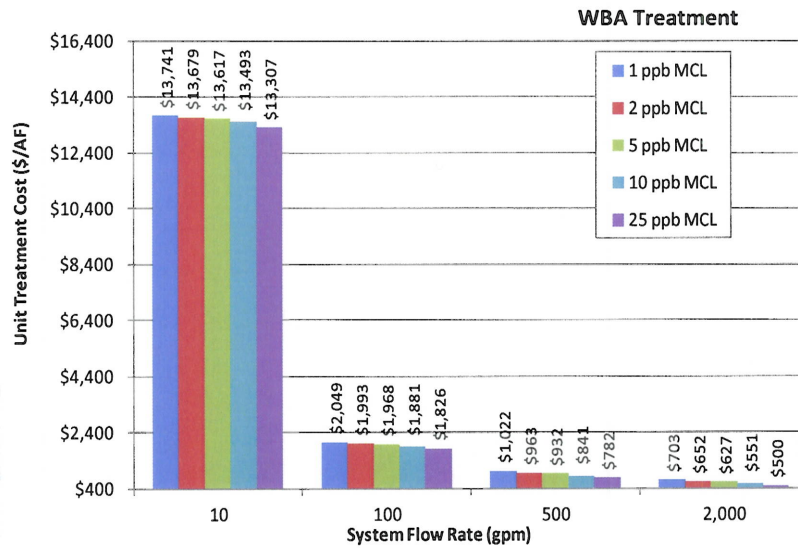


- 100 gallons per minute
- Partial treatment of well GN-3 adjacent to Glendale Water Treatment Plant
- Operations require more labor than WBA treatment
- Facility shutdown in late 2012 after research
- May be dismantled and removed after conferring with the EPA and CDPH

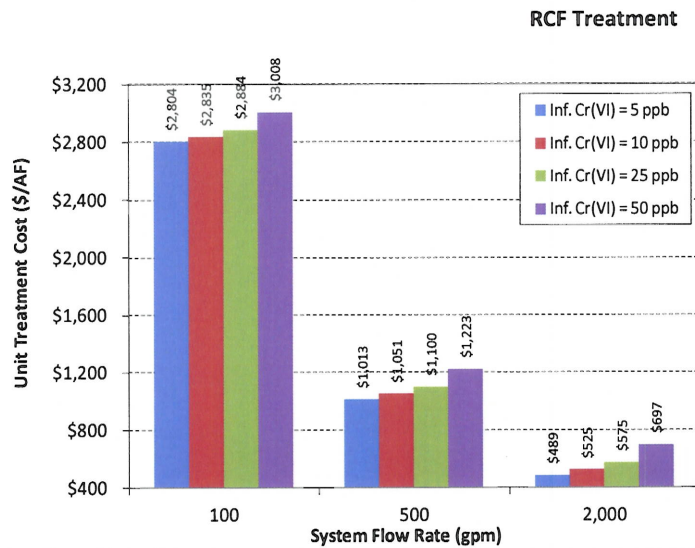
RESULTS

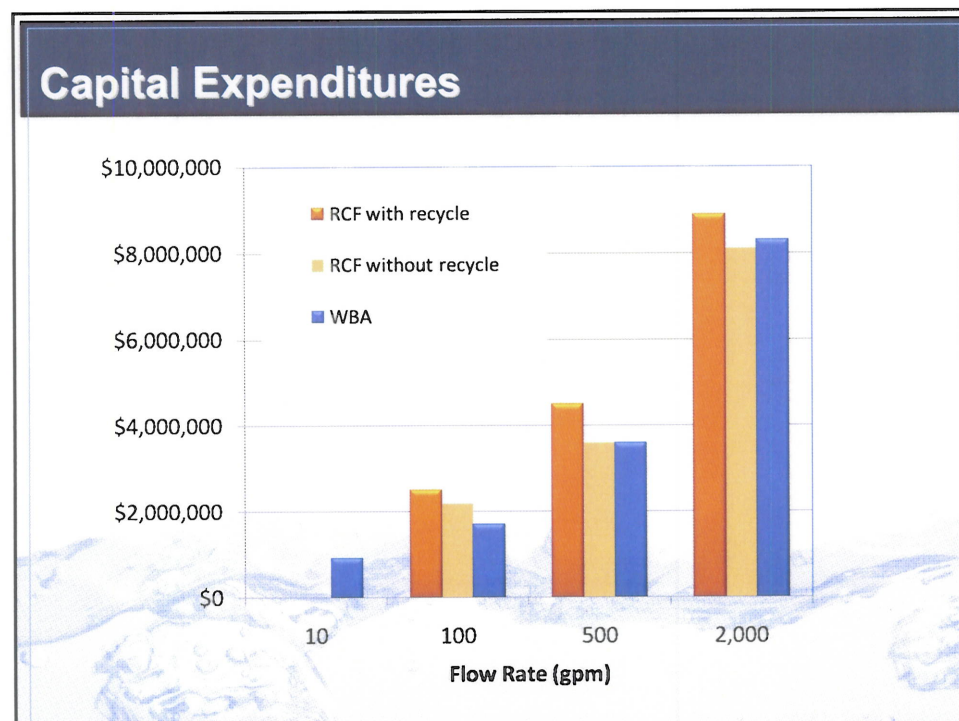
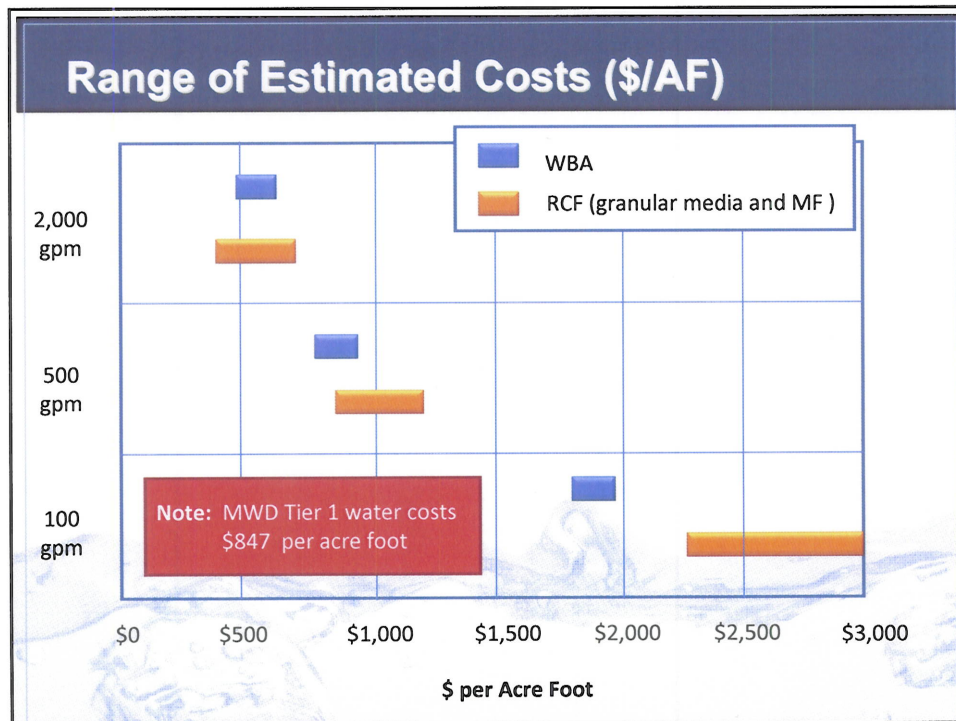
**Both technologies are
effective in removing
chromium 6**

Cost of Treatment Depends on MCL and Flow Rate



Cost of Treatment Depends on MCL and Flow Rate





Conclusions

- **Final Project Report to CDPH containing detailed technical and cost information for Cr6 removal**
 - **Needed as part of establishing MCL for Cr6**
- **The technologies tested are effective – but the cost will increase as lower Cr6 concentrations are targeted**

Thank You!